CLAIMS

What is claimed is:

1. A method of designing polymer probes, comprising:

providing a control sequence of monomers; and

designing polymer probes that have the same sequence of monomers and will bind with the control sequence but are formed with at least one different monomer addition cycle so that the integrity of the polymer probes may be verified.

2. The method of claim 1, wherein each polymer probe is represented as a list of monomer addition cycles.

3. The method of claim 2, wherein designing polymer probes comprises:

determining a shortest path with a weighted directed acyclic graph to generate a list of monomer cycles for synthesizing a polymer probes with the same sequence of monomers; and

utilizing a matrix to increase cycle differentiation.

4. The method of claim 3, wherein if the list of monomer cycles generated by determining a shortest path is undesirable, weights on the weighted directed acyclic graph are adjusted to prevent undesirable lists of monomer addition cycles.

5. The method of claim 1, wherein the polymer probes are attached to a substrate.

6. A computer program product that designs polymer probes, comprising:

computer code that receives a control sequence of monomers; and

computer code that designs polymer probes that have the same sequence of monomers and will bind with the control sequence but are formed with at least one different monomer addition cycle so that the integrity of the polymer probes may be verified; and

a computer readable medium that stores the computer codes.

7. The computer program product of claim 6, wherein the computer readable medium is selected from the group consisting of floppy disk, tape, flash memory, system memory, hard drive, and a data signal embodied in a carrier wave.

8. A substrate having polymer probes coupled thereto, comprising:

a plurality of regions on the substrate in which diverse polymer probes are coupled; and

a plurality of regions on the substrate in which polymer probes having the same sequence are coupled, wherein the polymer probes having the same sequence will bind with a control sequence of monomers but are formed with at least one different monomer addition cycle so that the integrity of the polymer probes may be verified.

9. The substrate of claim 8, wherein the plurality of regions are near the center of the substrate.

10. The substrate of claim 8, wherein the plurality of regions are in a checkerboard pattern on the substrate.

11. A method of verifying probe synthesis, comprising:

receiving hybridization affinity information regarding the binding of a control sequence of monomers to polymer probes that have the same sequence of monomers, wherein each polymer probe was formed with at least one different monomer addition cycle; and

analyzing the hybridization affinity information to determine if an error occurred during the synthesis of the polymer probes.

12. The method of claim 11, further comprising generating a determination that includes whether the probe synthesis was acceptable or unacceptable.

13. The method of claim 12, wherein the determination include whether the probe synthesis was marginal.

14. The method of claim 12, wherein the determination includes an indication of the reason the probe synthesis was determined to be unacceptable.

15. The method of claim 12, wherein the determination includes an indication of the polymer probes demonstrating the probe synthesis was unacceptable.

16. The method of claim 11, wherein the polymer probes are attached to a substrate.

17. A computer program product that verifies probe synthesis, comprising:

computer code that receives hybridization affinity information regarding the binding of a control sequence of monomers to polymer probes that have the same sequence of monomers, wherein each polymer probe was formed with at least one different monomer addition cycle;

computer code that analyzes the hybridization affinity information to determine if an error occurred during the synthesis of the polymer probes; and

a computer readable medium that stores the computer codes.

18. The computer program product of claim 17, wherein the computer readable medium is selected from the group consisting of floppy disk, tape, flash memory, system memory, hard drive, and a data signal embodied in a carrier wave.

19. A method of verifying a manufacturing process including a plurality of steps, comprising:

selecting a first plurality of steps from the manufacturing process for producing a first verification object; and

selecting a second plurality of steps from the manufacturing process for producing a second verification object, wherein the second verification object is the same as the first verification object but the second plurality of steps differs from the first plurality of steps by at least one step.

20. The method of claim 19, wherein the first and second verification objects have the same structure.

21. The method of claim 19, wherein the first and second verification objects are polymer probes, mechanical devices or electronic circuits.

22. A method of verifying a manufacturing process including a plurality of steps, comprising:

receiving structure information about a plurality of verification objects, each verification object has the same structure but differs from the other verification objects by at least step of the manufacturing process that was used to produce the verification objects; and

analyzing the structure information to determine if an error occurred during the synthesis of the plurality of verification objects.

23. The method of claim 22, wherein the plurality of verification objects are polymer probes, mechanical devices or electronic circuits.